

Based on these findings and conclusions, the Court holds that Plaintiff Kaist IP US LLC (“Plaintiff” or “KAIST”) is not barred from asserting its patent infringement claims based on equitable estoppel or implied license.

I. FINDINGS OF FACT (“FF”)

A. Procedural History

[FF1] At the pre-trial conference on April 18, 2018, Defendants withdrew their improper inventorship defense. (Dkt. No. 387, Hr’g Tr. at 9:20–21 (“Number 9 on page 7, the defendants will withdraw.”) (referring to Dkt. No. 323 at 7 (Joint Pre-Trial Order) (“(9) Each Defendant contends that the ’055 Patent is invalid because it failed to name all of the actual inventors.”).)

[FF2] Based on Defendants’ withdrawal, Defendants are precluded from raising any argument that Jong-Ho Lee, the named inventor of the patent-at-issue, is not the proper inventor or that there was an unnamed co-inventor. Accordingly, the Court need not make factual findings related to the date of conception, reduction to practice, or any claims of co-inventorship by Tai-Su Park.

B. The Patent-At-Issue: U.S. Patent No. 6,885,055

[FF3] On February 4, 2003, Jong-Ho Lee (“Professor Lee” or “Prof. Lee”) filed U.S. Patent Application No. 10/358,981 (the “’981 Application”), which issued on April 26, 2005 as U.S. Patent No. 6,885,055 (the “’055 Patent”). (Dkt. No. 1-1.) The ’055 Patent is titled “Double-Gate FinFET Device and Fabricating Method Thereof.” (*See id.*)

[FF4] On January 30, 2002, the Korea Advanced Institute of Science and Technology filed a Korean patent application that named Professor Lee as the inventor. (Dkt. No. 221-3, Ex. 2 (Korean Application Number 10-2002-0005325); Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 139:16–25.) The Korean application registered on November 12, 2004 as Korean Patent No. 10-0458288 (“Korean Counterpart Patent”). (Dkt. No. 221-3, Ex. 2.)

[FF5] The specifications of the two applications—the Korean application filed in January 2002 and its U.S. counterpart, the '981 Application—are virtually identical in substance even though the '981 Application does not claim priority to the Korean application. (Dkt. No. 488 June 11, 2018 P.M. Trial Tr. 87:18–88:8 (“[MR. SHEASBY]: How does the Korean patent application compare to the '055 patent? [PROF. LEE]: They are substantially identical.”); *see also* Dkt. No. 561 at 2.)

[FF6] In 2003, Professor Lee entered into an agreement with P&IB, Co. Ltd. (“P&IB”) that transferred a 36% share of the '055 Patent. (Dkt. No. 534-17, Ex. 14 at 122:15–123:2, 124:3–18 (Deposition of Yong-Ho Son); Dkt. No. 534-18, Ex. 15 at 261:8–262:25 (Deposition of Yong-Ho Son).)

[FF7] On July 12, 2016, P&IB and Professor Lee assigned their respective rights to the '055 Patent to KAIST IP Co. Ltd. (Dkt. No. 534-17, Ex. 14 at 124:24–125:20 (Deposition of Yong-Ho Son); *see also* Dkt. No. 229-5, Ex. 2 (Assignment of '055 Patent to KAIST IP Co. Ltd.).)

[FF8] On July 25, 2016, KAIST IP Co. Ltd. assigned its rights to the '055 Patent to Plaintiff KAIST IP US LLC (“Plaintiff” or “KAIST”), its wholly-owned U.S. subsidiary. (Dkt. No. 534-17, Ex. 14 at 129:20–131:7; *see also* Dkt. No. 229-5, Ex. 3 (Assignment of '055 Patent to KAIST IP US LLC).)

C. Collaboration with Tai-Su Park

[FF9] Dr. Tai-Su Park was an engineer at Samsung from December of 1989 to March of 2018. (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 22:20–24.)

[FF10] Tai-Su Park attended Seoul National University seeking to obtain a doctoral degree from March of 2001 to February of 2005. (Dkt. No. 488, June 13, 2018 P.M. Trial Tr. at 25:7–9.)

[FF11] Tai-Su Park worked with Professor Lee while Park was a graduate student at Seoul National University. (Dkt. No. 488, June 13, 2018 P.M. Trial Tr. at 25:10–13, 26:7–27:6.)

[FF12] Tai-Su Park was not asked to work on a bulk FinFET device by Professor Lee until the end of 2001. (Dkt. No. 547-3 at 34:2–24 (Deposition of Jong-Ho Lee); Dkt. No. 547-7 at 32:23–33:2 (Deposition of Tai-Su Park).)

[FF13] Professor Lee paid a salary to Tai-Su Park. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 91:23–92:1 (“Although I paid a salary, he was a Samsung engineer sent by Samsung to receive training”).) According to Professor Lee, Tai-Su Park “was a Samsung engineer sent by Samsung to receive training at Seoul National University.” (*Id.* at 91:25–92:1.)

[FF14] Tai-Su Park testified that Professor Lee asked him to use the resources at Samsung “to help with his idea.” (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 32:3–20.)

[FF15] A 2003 publication by Tai-Su Park, Euijoon Yoon, and Professor Lee states “we propose a new body-tied double-gate MOSFET on bulk Si wafer [4],” where “[4]” cites the Korean Counterpart Patent. (PX0624 at 1, 7; *compare* Dkt. 1-1 (the ’055 Patent), *with* Dkt 221-3 (Korean Counterpart Patent). Professor Lee testified that the phrase “body-tied Omega MOSFET” is the term used in the field to describe the design of the ’055 Patent. (PX0624 at 1; Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 89:11–13.)

[FF16] Tai-Su Park testified that he knew about the Korean Counterpart Patent as early as September 2002. (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 41:10–12; *see also* Dkt. No. 547-7 at 9:13-19, 32:23–33:12, 80:25–82:10, 143:15–18, 144:9–16 (Deposition of Tai-Su Park).)

[FF17] However, Tai-Su Park testified that he did not know about the ’055 Patent until 2011. (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 43:1–4; *see also* Dkt. No. 534-5, Ex. 2 at 133:23–134:8 (Deposition of Tai-Su Park).)

[FF18] The first physical transistor embodying the '055 Patent invention was created before Tai-Su Park discussed the design with Samsung. (Dkt. No. 547-7 at 74:18–22, 77:23–78:3, 80:25–81:3, 123:1–5.) Tai-Su Park testified that after he worked with Professor Lee to build the bulk silicon FinFET at Seoul National University, he then discussed the design with Samsung. (*Id.* at 77:23–78:3.)

[FF19] Based on the record before the Court, there is no evidence that Professor Lee communicated to Tai-Su Park that Samsung could use the claimed inventions of the '055 Patent in any way.

[FF20] Based on the record before the Court, there is no evidence that prior to 2011, Professor Lee had any communications with Tai-Su Park regarding the '055 Patent *at all* since Tai-Su Park testified that he did not even know about the '055 Patent until then. Defendants presented no evidence to rebut this finding.

D. Collaboration with Samsung

a. Relationship with Samsung That Was Centered on University Research

[FF21] Professor Lee testified that he had a relationship with Samsung as early as 2000 when he was a visiting lecturer. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 110:7–17.)

[FF22] Defendants point to DX732 to support their proposition that Samsung supported Professor Lee's research as early as 1999. (Dkt. No. 570 at 10.) This document is titled "Tera Level Nano Devices Development Project Task (Application Plan)." (*See* DX732.) Defendants never presented this document at trial nor did they ask any witness about it. Without more, the Court is unwilling to find that this document evidences Samsung's direct support of Professor Lee's research on transistors. However, on its face, it shows that Professor Lee was involved in a research project from 1999-2000 for which Samsung may have been paying the research expenses.

Importantly, there is no evidence that this research project correlates in any way with the '055 Patent or the development thereof.

[FF23] Professor Lee authored several publications that referenced his relationship with Samsung and its support for his underlying research. (*See, e.g.*, Dkt. No. 489, June 12, 2018 P.M. Trial Tr. at 39:23–40:6 (Professor Lee); Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 124:16–125:3, 132:22–133:11 (Professor Lee); DX026 at DX026-0001 (“This work was supported in part by Samsung.”); DX401 at DX401-0009 (listing “Samsung Electronics Inc.” as the “supporting organization” for research project titled “30 nm or less level Design of CMOS devices” from March 1, 2002 to April 30, 2002).

[FF24] None of these publications, related to Professor Lee’s research, specify that Samsung provided support for the FinFET design at issue or the '055 Patent. (*Compare* DX732; DX126; DX401; *with* Dkt. No. 489, June 12, 2018 A.M. Trial Tr. at 34:20–35:5.)

[FF25] Professor Lee testified that he asked Samsung if he could carry out “design activities” for his research ideas with Samsung’s semiconductor group. (*Id.* at 122:12–15.)

[FF26] In an email dated August 20, 2002 from Professor Lee to Ki-Nam Kim (“VP Kim”), Samsung’s Vice President at the time, Professor Lee stated that he would continue to work on the body-tied double-gate device. (DX554 at DX554-0003; PX1378 at KAIST-028712.)¹

[FF27] While the email references the manufacture of a device at Samsung, the email does not specify which device Professor Lee is referring to. (DX554 at DX554-0003; PX1378 at KAIST-028712.) Professor Lee later references the difficulties with extracting a model for the bulk

¹ The Court notes the translation variations between Plaintiff’s exhibit and Defendants’ exhibit. (*Compare* PX1378, *with* DX554.) While the differences do not affect the Court’s ultimate findings because the emails predate the '055 Patent or Samsung’s knowledge of such, the Court finds Plaintiff’s translation more consistent with Professor Lee’s testimony and thus more credible. Nevertheless, where the Court cites to both exhibits, they both support the Court’s underlying factual finding.

double-gate device, and that he had plans to work on the model with his students. (DX554 at DX554-0003; PX1378 at KAIST-028712.)

[FF28] In that same email, Professor Lee also asks to use Samsung's facilities to carry out the modification of the model and other related tasks. (DX554 at DX554-0003; PX1378 at KAIST-028712; *see also* DX488, June 11, 2018 P.M. Trial Tr. at 123:24–124:6.)

[FF29] While the email references the body-tied double-gate device, the email predates the '055 Patent or its application. (*See id.*)

[FF30] The Court finds that this email is consistent with Professor Lee's testimony that he asked Samsung if he could carry out "design activities" at Samsung.

[FF31] On September 27, 2002, Professor Lee again emailed VP Kim. (*See generally* DX554; PX1378.) Professor Lee acknowledged that the body tied double-gate was his own idea. (DX554; PX1378.) However, he did ask VP Kim if Samsung would want to make the double-gate one of Samsung's key structures. (DX554; PX1378.)

[FF32] According to Defendants' translation of the email, Professor Lee also states "I think Samsung should gradually prepare the device from now on with which it will have to compete in the future." (DX-554-0002.) However, Plaintiff's translation of the same sentence is: "I think Samsung should prepare one by one about which device it is going to compete with to win." (PX1378 at KAIST-027811.)

[FF33] Professor Lee testified that in this email, he was telling VP Kim "that body-tied, double-gate, in other words, bulk FinFET, is an important future transistor design." (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 97:22–98:8.) VP Kim did not testify or present evidence to the Court. Consequently, Professor Lee's testimony regarding his understanding of the email is uncontroverted.

[FF34] In light of Professor Lee’s testimony at trial and considering the context of the email, the Court finds that Professor Lee’s statement in such email that Samsung should prepare its own device was not equivalent to Professor Lee telling Samsung that it should (or could) use his research without permission.

[FF35] This email predates the ’055 Patent or its application. (*See id.*)

[FF36] Samsung ultimately decided to collaborate with Professor Lee on his bulk FinFET design. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 98:9–12.) Professor Lee testified that he collaborated with Samsung because it was his “belief that Samsung would become the commercial partner of [his] design.” (*See id.* at 98:13–15.)

[FF37] Donggun Park, a member of the Advanced Technology Development Team at Samsung’s R&D Center, stated in an email to Professor Lee on November 25, 2002 that Samsung had no claim to Professor Lee’s work: “I think I made my it [*sic*] clear at the last meeting that the patent is not ours as our company [Samsung] did not develop it.” (PX1374 at 1.)

[FF38] Professor Lee testified that in that same email, Donggun Park acknowledged that Professor Lee developed and invented the bulk FinFET. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 99:11–18.) Donggun Park did not testify at trial. Professor Lee’s testimony is uncontroverted.

[FF39] This email predates the ’055 Patent or its application. (*See generally* PX1374.)

[FF40] Defendants submitted a draft report to the Minister of Science and Technology (“MOST”) of Korea that states “[t]he core technology was transferred to Samsung Electronics, where it was successfully rendered for the first time.” (*See generally* Dkt. No. 534-19 at 118 (“Defendants’ August 2003 MOST Report”).) Plaintiff’s translation, in contrast, states that Samsung was able to create a “successful implementation in the first phase.” (Dkt. No. 547-8 at

118 (“Plaintiff’s August 2003 MOST Report”). The “[c]orresponding state research period” is July 2000 to June 2003. (Defendants’ August 2003 MOST Report at Abstract.)

[FF41] Plaintiff’s translation is corroborated by Tai-Su Park’s testimony that the first bulk FinFET transistor was made before he took the design to Samsung. *See* FF18.

[FF42] Defendants’ August 2003 MOST Report includes the Korean version. Despite being mostly in Korean, the Summary is translated into English. (*See* Defendants’ August 2003 MOST Report at 12–21.) Under Section III (which is titled Contents and Scope of Project), the report states “[t]he 60 120 nm Omega MOSTFETs were fabricated *at Samsung Electronics*.” (Defendants’ August 2003 MOST Report at 14 (emphasis added).) Defendants’ translation of that same section states “*Samsung Electronics has fabricated* a 60-120 nm Omega MOSTFET.” (*Compare* Defendants’ August 2003 MOST Report at 14, *with id.* at 6 (emphasis added).)

[FF43] The Court finds that the English summary at the beginning of the Korean version is more consistent with the record before the Court, which is that Professor Lee used Samsung’s facilities for design activities.

[FF44] The report goes on to state that for MOSTFET:²

Device structure, key process technologies, and know-how was transferred to the semiconductor industry, by which they can alleviate scaling-down problem of conventional CMOS devices and get the lead in tough competition.

(Defendants’ August 2003 MOST Report at 20.) This language contradicts Defendants’ translation that the “core technology” was transferred specifically to Samsung.

[FF45] Defendants’ August 2003 MOST Report further states that “[t]he major core technologies of the body-tied double-gate device developed through this study were transferred to

² The report designates “Omega MOSTFET” as the “40 nm body-tied FinFET.” (Defendants’ August 2003 MOST Report at 14.)

Samsung Electronics” (Defendants’ August 2003 MOST Report at 139.) This section of the report goes on discuss the manufacturing techniques used by Professor Lee to create the invention, and not the invention itself:

Multiple unit process technologies must take place together in order to develop nano CMOS device. The underlying base technology is lithography technology, and e-beam lithography technology must be used to patterning of equal to or less than 50 nm. If the patterning technology established by our research team is used, 20 nm patterning can be obtained stably, which can be applied to diverse fields....

(*Id.* at 139.)

[FF46] The Court finds that Defendants’ 2003 MOST Report is silent regarding any transfer of ’055 Patent rights to Samsung.

[FF47] The Court further finds that Defendants’ 2003 MOST Report does not contain any indication that the statements in the document are expressly made (or adopted) by Professor Lee. Defendants have failed to establish that the statements made in any document to Korea’s MOST are Professor Lee’s statements.

[FF48] The Court further finds that Defendants’ 2003 MOST Report does not contain any statement from Professor Lee to Samsung. Although Samsung is referenced in the report, Samsung is not a party to the document nor is it listed as the supervisory research institute, cooperative research institute, or commissioned research institute. (Defendants’ 2003 MOST Report at Presentation Report, Abstract.)

[FF49] Defendants do not represent that they ever saw Defendants’ 2003 MOST Report prior to this litigation.

[FF50] Defendants point to another “report” to MOST that is dated March 4, 2004 (the “March 2004 Report”). (DX047 at 1.)

[FF51] Defendants do not come forward with any description of the circumstances surrounding the March 2004 Report. For example, the March 2004 Report is in a different format

than Defendants' 2003 MOST Report. It appears to be a slide show presentation. (*See generally* DX047.) There is no evidence of who the presentation was directed to or if Samsung ever saw the presentation.

[FF52] The March 2004 Report also draws a distinction between a "device" design and core "technologies." (DX047 at DX047-0110.)

[FF53] The Court finds that the March 2004 Report suffers from the same deficiencies as Defendants' 2003 MOST Report.

[FF54] Defendants also point to another report to MOST from 2004. (*See generally* DX732.) The Court also finds that this report suffers the same deficiencies as Defendants' 2003 MOST Report and the March 2004 Report.

[FF55] The Court finds that there is no agreement that Professor Lee, P&IB, or KAIST (and its parent company) had any obligation to license the '055 Patent to Samsung. Nor did Professor Lee have a duty to disclose the '055 Patent to Samsung.

b. Funding of the '055 Patent

[FF56] At trial, Dongwon Kim testified as Samsung's corporate representative. (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 94:20–22.)

[FF57] Dongwon Kim testified that he did not identify as part of his testimony at trial "any evidence that Professor Lee received any funding from Samsung relating to the '055 patent." (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 18:7–11.)

[FF58] The publications on the omega bulk FinFET design do not reference any support from Samsung. (*See* PX0624, PX0669, PX0707.) Defendants do not dispute this. (Dkt. No. 570 at 7 (Defendants' Proposed Findings of Fact and Conclusions of Law) ("While these publications make no explicit reference to Samsung's support").)

[FF59] Rather, Defendants point to two press releases issued in March 2003 which they contend constitute evidence that Samsung directly supported the '055 Patent. (Defendants' Proposed Findings of Fact and Conclusions of Law at 8 (citing DX670 and DX047).)

[FF60] The first press release, which is dated March 25, 2003, appears to be from the "Public Relations and Information Team" of Korea's MOST. (DX670 at DX670-0001.) The press release states that Professor Lee's research team "realized 40 nm class dual gate CMOS device by using cheap bulk silicon board through its own fabrication and fabrication support from Samsung Electronics." (*Id.*)

[FF61] That is the only mention of Samsung's alleged support in the press release. (*See id.*)

[FF62] Notwithstanding that the press release is hearsay, the Court finds that the press release's statement that Samsung provided "fabrication support" fails to justify a finding that Samsung provided valuable support for Professor Lee's work on the '055 Patent. There is no description of what "fabrication support" is or what it entails or how Samsung may have provided such. Consistent with Professor Lee's testimony, this more likely supports Professor Lee's position that he used Samsung's facilities to conduct his design activities.

[FF63] Even if this was adequate to find that Samsung provided valuable support for Professor Lee's work, there is also nothing to specifically tie "fabrication support" and the '055 Patent. While the press release states that "[a]s of now, three domestic and five international patents have been filed with respect to this technology," the press release shows no correlation between Samsung's "fabrication support" and the '055 Patent. (*Id.* at DX670-0002.) Without more, the Court is unable to determine whether such "fabrication support" was tied to the '055 Patent or these other referenced patents. No such nexus has been shown.

[FF64] Defendants also point to a “March 26, 2003 press release.” (*See* DX047 at DX047-0111.) This appears to be a slide that contains a portion of the press release—not the press release itself.³ (*See id.*) The portion of the press release states that “[a] team led by Professor Lee Jong-ho of Kyungpook University . . . announced on the 25th that it succeeded in realizing a 40nm double-gate CMOS device with higher integration and performance than existing devices on inexpensive bulk silicon wafer, with support from Samsung Electronics.” (*Id.*)

[FF65] The Court finds that this press release does not support a finding that Samsung provided valuable support for Professor Lee’s work on the ’055 Patent. There is no description of what “support” Samsung provided. Consistent with Professor Lee’s testimony, this could simply be referencing Professor Lee’s use of Samsung’s facilities to conduct design activities. There is also no tie or nexus between the “support” and the ’055 Patent.

[FF66] Also, the joint publications between Professor Lee and Samsung on omega bulk FinFET design cited by Defendants do not reference any support from Samsung. (*See, e.g.*, DX015, DX016, DX017, DX495, DX756, DX757, DX759, PX1304.)

[FF67] The Court finds that these joint publications are indicative of, at most, an informal relationship between Samsung and Professor Lee that was founded, in part, on a relationship between Samsung and the universities where Professor Lee taught. There is nothing to establish that Samsung was providing services for which it reasonably expected to be compensated, such as obtaining a right to use Professor Lee’s patents. (*See* Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 94:23–95:9 (“[MR. SHEASBY]: [W]hy isn’t Samsung listed as a source of funding in the joint article? [PROF. LEE]: That is because Samsung did not provide funding for the research. [MR. SHEASBY]: If Samsung made the device for the second time, what did you do

³ Plaintiff did not object to this piece of evidence so the Court will not address its admissibility.

in these joint papers? [PROF. LEE]: I did what the university was good at doing, providing advance simulation for the design of the transistors and for the transistors that have been made providing in-depth analysis.”.)

[FF68] Defendants further point to a June 26, 2006 proposal from Professor Lee titled “Industry-Academy Collaborative Research and Development Proposal” as evidence that Samsung provided valuable consideration for rights to use the ’055 Patent. (DX401 at DX401-0002; *see also* Defendants’ Proposed Findings of Fact and Conclusions of Law at 9.) According to Defendants, “Prof. Lee requested 45 million Korean Won from Samsung (about \$39,933 U.S. dollars), and Samsung accepted his proposal.” (Defendants’ Proposed Findings of Fact and Conclusions of Law at 9.)

[FF69] The Court finds that this proposal makes no reference to the ’055 Patent or its application. Nor does it reference any transfer of rights to the ’055 Patent.

[FF70] Based on the record before the Court, the Court finds that Professor Lee used Samsung’s facilities for research related to his development of the bulk omega FinFET design. There is no evidence that his use of Samsung’s facilities was a quid pro quo for Samsung’s right to access his underlying research or obtain rights to the ’055 Patent. Neither did Professor Lee ever communicate to Samsung that his use of their facilities meant Samsung had any right to use the ’055 Patent.

[FF71] Based on the record before the Court, the Court finds that there is no evidence that Samsung provided valuable support for Professor Lee’s work on the ’055 Patent. Samsung merely acquiesced in Professor Lee’s use of their facilities, without any connection or nexus between such use and the ’055 Patent.

[FF72] The Court further finds that Samsung never provided Professor Lee with any compensation for the '055 Patent.

c. The Nitride Liner Patents^{4,5}

[FF73] Professor Lee and his co-inventors at Samsung, including Dr. Tai-Su Park, filed U.S. Patent Appl. No. 10/780,067, which issued on December 12, 2006 as U.S. Patent No. 7,148,541 (the "'541 Patent"). (Dkt. No. 534-5, Ex. 2 at 43:20–44:19 (Deposition of Tai-Su Park); *see also* PX0187).) Dr. Park testified that this patent relates to the nitride layer that is used to protect that mask of the FinFET device. (*See id.*)

[FF74] On November 6, 2006, Prof. Lee and his co-inventors at Samsung, including Dr. Tai-Su Park, filed U.S. Patent Appl. No. 11/556,804, which issued on December 2, 2008 as U.S. Patent No. 7,459,359 (the "'359 Patent"). (Dkt. No. 534-5, Ex. 2 at 43:20–44:19 (Deposition of Tai-Su Park); *see also* PX0188.) Dr. Park testified that this patent also relates to the nitride layer that is used to protect that mask of the FinFET device. (*See id.*)

[FF75] Dr. Park further testified that Samsung paid 20 million Korean Won to Professor Lee and Professor Yun for the assignments of the '541 Patent and the '359 Patent

⁴ Defendants also argue that "[w]hile the nitride liner patents cited the '055 Patent, there is no evidence that Prof. Lee disclosed the '055 Patent to his co-inventors pursuant to his duty to disclose information material to patentability [under 37 C.F.R. § 1.56]." (Defendants' Proposed Findings of Fact and Conclusions of Law at 13.) Defendants' argument is nonsensical. Not only did Defendants withdraw their inventorship defense before trial (which forecloses any argument that Dr. Park is a co-inventor of the '055 Patent), but also the duty to disclose material information is a duty owed to the PTO—not the alleged co-inventors. *See* 37 C.F.R. § 1.56 ("Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing **with the Office.**") (emphasis added). If anything, that the Nitride Liner Patents cite the '055 Patent as prior art gives the presumption that Dr. Park had knowledge of the '055 Patent prior to 2011 as he testified.

⁵ Plaintiff's Proposed Findings of Fact and Conclusions of Law cite to PX1820.3-4 and PX1822.1 for the proposition that Samsung's conduct related to a subsequently filed Korean patent application demonstrates a recognition by Samsung that Professor Lee's inventions were not the result of an "industry-university project" and consequently, Samsung needed to pay Professor Lee for those rights if it desired to use them commercially. (*See* Dkt. No. 569 ¶¶ 39–42.) However, such exhibits were never provided to the Court, and as such, the Court is unable to consider them.

(collectively, the “Nitride Liner Patents”). (Dkt. No. 534-5, Ex. 2 at 48:16–49:5 (Deposition of Tai-Su Park).)

[FF76] Professor Lee testified that the technology in the Nitride Liner Patents involves a nitride liner used during the construction of the transistor. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 96:1–21.) Both Dr. Park and Dr. Kim testified that this technology is not used in Samsung’s commercial FinFET technologies. (Dkt. No. 547-7, Ex. F at 48:3–6 (Deposition of Tai-Su Park); Dkt. 547-9, Ex. H at 126:10–18 (Deposition of Dongwon Kim).)

[FF77] Defendants did not introduce any evidence at trial that Professor Lee made any statements regarding the ’055 Patent, Samsung’s use of it, or any transfer of it during the discussions related to the Nitride Liner Patents.

[FF78] The Court finds that no misleading conduct related to Professor Lee and the ’055 Patent resulted from the Nitride Liner Patents.

d. Professor Lee’s Subsequent Lectures at Samsung

[FF79] Professor Lee gave lectures at Samsung throughout the 2000s for which Samsung compensated him. (Dkt. No. 534-4, Ex. 1 at 110:6–24, 112:11–113:12 (Deposition of Jong-Ho Lee); Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 124:10–15.)

[FF80] Defendants did not introduce any evidence that Professor Lee made any statements regarding the ’055 Patent, Samsung’s use of it, or any transfer of it during these lectures.

[FF81] Defendants did not introduce any evidence that the compensation for these lectures related in any way to the ’055 Patent.

e. Professor Lee's Continued Collaboration with Samsung

[FF82] Professor Lee continued to work with Samsung on different research areas until this litigation started. (*See, e.g.*, Dkt. 534-24, Ex. 21 (2011 publication co-authored by Prof. Lee and Samsung employee).)

[FF83] From 2014 to 2017, Samsung provided further financial support for Professor Lee's research through a grant of \$1.65 million. (*See* DX023 (news article stating that "Professor Jong-Ho Lee has been funded by Samsung for a project to develop the fundamental enabling technology for neuromorphic devices as the sole principal investigator.")) Professor Lee does not dispute receiving this grant. (Dkt. No. 489, June 12, 2018 A.M. Trial Tr. at 12:9–14.)

[FF84] There is no evidence that this grant was in any way related to the '055 Patent.

[FF85] Accordingly, the Court finds that the grant was unrelated to the '055 Patent.

E. Samsung's Knowledge of the '055 Patent

[FF86] According to a declaration that was submitted in support of Defendants' Findings of Fact and Conclusions of Law, Samsung became generally aware of the '055 Patent in 2006. (Dkt. No. 534-1 ¶ 10 ("Kim Declaration").)

[FF87] Such testimony is consistent with Samsung's assignment of the Nitride Liner Patents, which cite the '055 Patent as prior art.

[FF88] Accordingly, the Court finds that Samsung knew about the '055 Patent in 2006.

F. Samsung's Own Development of the Bulk FinFET Device

[FF89] Dongwon Kim testified at trial that Samsung started research and development on FinFET technology in the early 2000s. (Dkt. No. 493, June 13, 2018 P.M. Trial Tr. at 100:4–8.)

[FF90] However, he did not begin working on bulk FinFET technology until 2003. (Declaration of Dongwon Kim ¶ 2.)

[FF91] Defendants cite to U.S. Patent No. 6,767,813 (the “’813 Patent”), which was filed on October 26, 2011, as “unambiguous evidence of research on bulk FinFET structures at Samsung that predate Prof. Lee’s work with Tai-Su Park in 2001.” (Defendants’ Proposed Findings of Facts and Conclusions of Law at 15 (citing DX293).).

[FF92] Defendants presented no evidence that the ’813 Patent is related Samsung’s “research on bulk FinFET structures.” No witness from Samsung testified as to the ’813 Patent, its contents, or the development and research leading to it.

[FF93] Defendants presented no evidence that the ’813 Patent is related to the technology claimed in the ’055 Patent.

[FF94] Accordingly, the Court finds that the ’813 Patent is as presented at trial by Defendants not sufficient evidence that Samsung was researching bulk FinFET structures prior to Professor Lee’s work with Tai-Su Park in 2001.

[FF95] Dongwon Kim testified that the research period for Samsung’s 14 nm FinFET technology was from 2003 to 2009. (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 101:18–102:7; *see also* Dkt. No. 534-5, Ex. 2 at 98:10–13 (Deposition of Dongwon Kim) (estimating that 50 engineers were involved in the bulk FinFET research at Samsung from 2003-2006).)

[FF96] Dongwon Kim further testified that product definition was complete in December 2011, and Samsung first introduced the bulk FinFET technology to a customer (Apple) in 2009. (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 98:16–18; 101:18–102:7.) Samsung released its first process design kit (PDK) in January 2012. (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 101:7–102:7.)

[FF97] There is no evidence that Professor Lee or P&IB were aware of these events.

[FF98] Dongwon Kim further testified that the first working processor with the bulk FinFET design was not created until “the end of 2012 or early 2013.” (Dkt. No. 547-9, Ex. H at 37:22–38:7 (Deposition of Dongwon Kim).)

[FF99] He also testified that the shape of the epitaxial source/drain layers of the 14 nm bulk FinFET design was still in process in 2011-2013. (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 7:17–18:8.)

[FF100] There is no evidence that Professor Lee or P&IB were aware of these events.

[FF101] The Court finds that Samsung’s bulk FinFET design was not complete until after Samsung was put on formal notice in 2012 by P&IB that Samsung would need to license the ’055 Patent if it wanted to use the technology.

[FF102] Samsung also decided to implement the bulk FinFET technology in its own commercial products around 2010. (Dkt. No. 534-23, Ex. 20 at 31:25–32:11 (Deposition of Dongwon Kim).)

[FF103] There is no evidence that Professor Lee or P&IB were aware of these events.

[FF104] The joint publications on bulk FinFET between Professor Lee and Samsung cited by Defendants ceased before 2006.⁶ (Dkt. Nos. 534-6–534-16; DX015; DX016; DX017; DX495; DX756; DX757; DX759; PX1304.)

[FF105] Defendants did not present any evidence that Professor Lee or his successors had any ongoing information on Samsung’s commercial bulk FinFET plans after 2006.

[FF106] Heedon Jeong testified that he was responsible for transitioning the 14 nm design to mass production, and that the design was not released to the mass production facility

⁶ The 2011 publication cited by Defendants (Dkt. 534-24) is directed to *planar* transistor design.

until 2013-2014. (Dkt. No. 547-13, Ex. L at 19:22–25, 26:1-9, 26:19-23 (Deposition of Jeong Heedon).)

[FF107] Samsung did not transfer the 14 nm bulk FinFET design to its manufacturing facility in the United States until “the end of 2015 or 2016.” (See Dkt. No. 547-9, Ex. H at 63:10–17 (Deposition of Dongwon Kim).)

[FF108] Samsung did not send customers test chips using the infringing design until “the middle of 2014 or ’15 time frame.” (See Dkt. No. 547-9, Ex. H at 64:23–65:5 (Deposition of Dongwon Kim).)

[FF109] Samsung did not publicly announce that it would begin selling chips with the 14 nm bulk FinFET design until February-March of 2015. (See PX1197 (*Samsung Announces Mass Production of Industry’s First 14nm Mobile Application Processor*, SAMSUNG NEWSROOM (Feb. 16, 2015)); PX1334 at KAIST-035016 (Mar. 2, 2015 Samsung press release for Galaxy S6 devices with “[t]he world’s first 14nm mobile processor”).)⁷

[FF110] Defendants did not present any evidence of when Samsung publicly announced that it would be selling chips with the 14 nm bulk FinFET design.

[FF111] Both parties’ experts in this case confirmed that the first act of infringement was either at the end of 2014 or the beginning of 2015. (See, e.g., Dkt. 547-21, Ex. T ¶ 62 (Report of Roy Weinstein); Dkt. 547-22, Ex. U ¶ 11 (Report of Stephen Becker).)

[FF112] The TechInsights report that KAIST used for its original infringement contentions was not published until May 2015. (PX0373 ¶ 5.) KAIST’s 30(b)(6) witness, Yong-

⁷ Samsung cites to Paragraphs 36 and 37 of the Complaint for the allegation that it had “reached a milestone in the development of 14nm-nanometer (nm) FinFET process technology” in December 2012 and that “Samsung announced its first generation FinFET technology . . . for 14nm bulk FinFET chips” in February 2014. The cited paragraphs of the Complaint do not indicate that there was any public knowledge of imminent release in the United States on these dates. The Complaint indicates that the first announcement of mass production, and thus actual commercial release, was in February 2015. Dkt. 1 ¶ 37.

Ho Son, agreed that the only insight P&IB had into Samsung's designs was this TechInsights report. (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 133:9–16 (Testimony of Yong-Ho Son).)

[FF113] Mr. Son further testified that Samsung's internal development was secret: "And to be clear, KAIST IP US didn't have any visibility into Samsung's R&D or manufacturing processes." (Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 134:20–23.)

[FF114] It is estimated that Samsung invested \$300 million in bringing the bulk FinFET technology to market. (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 99:16–22 (Dongwon Kim).)

[FF115] Based on the record before the Court, the Court finds that neither Professor Lee nor P&IB nor KAIST (or its parent company) knew of Samsung's potentially infringing activities until at least the end of 2014.

G. Communications Regarding the '055 Patent

a. Communications With Samsung

[FF116] Professor Lee testified that he asked VP Kim to license the claimed technology. (Dkt. No. 488, June 11, 2018 P.M. Trial Tr. at 97:5-13 (testifying that he asked VP Kim "to collaborate further in research" and "to license the technology.")) Professor Lee did not specify the time at which this conversation about licensing occurred, but emails between Professor Lee and VP Kim show that this conversation occurred in 2002. (*See, e.g.*, PX2068.)

[FF117] Defendants concede that there is no evidence that there was any conversation between Professor Lee and Samsung about the '055 Patent between 2002 and 2011. (Defendants' Proposed Findings of Fact and Conclusions of Law at 18.)

[FF118] P&IB contacted Samsung about licensing the '055 Patent in 2011, 2012, 2015, and 2017. (Dkt. No. 489, June 12, 2018 A.M. Trial Tr. at 29:11–15.)

[FF119] In 2011, Samsung and P&IB had discussions regarding the '055 Patent. (Dkt. No. 547-12, Ex. K at 10:8-18, 11:13–18 (Deposition of Jong-Soo Seo).)

[FF120] The patent group within Samsung's Semiconductor R&D center was made aware of the '055 Patent and evaluated it with at least one engineer in the group. (*See id.* at 12:22–14:15.) Samsung's IP center, which includes U.S. lawyers, was also made aware of the '055 Patent. (*Id.* at 14:16–16:11.)

[FF121] On November 27, 2011, Hyein Kim from Samsung wrote an email to the vice president of P&IB, Kang In-gyu, stating that “I would be grateful if you could suggest new terms and conditions for Assignment regarding the FinFET patent by next month.” (PX1861 at 1.)

[FF122] The Court finds that Samsung's response to P&IB is inconsistent with any belief held by Defendants that they had an implied right (or license) to the '055 Patent or that the '055 Patent would not be asserted.

[FF123] In 2012, P&IB again approached Samsung regarding licensing of the '055 Patent. (Dkt. No. 547-12, Ex. K at 16:17–25 (Deposition of Jong-Soo Seo).)

[FF124] In December 2014, P&IB again approached Samsung regarding licensing of the '055 Patent. (Dkt. No. 295-34 ¶ 3 (translating an email conversation between Samsung and P&IB) (“I am also sending PPT materials that briefly introduce technologies based on the US patents”).)

[FF125] In May 2015, P&IB again approached Samsung to discuss licensing the '055 Patent. (Dkt. No. 295-34 ¶ 4 (translating an email conversation between Samsung and P&IB) (“As you mentioned over the phone last time, we summarized your company's position regarding the purchasing and licensing of the patents that we suggested. . . . Tri-gate (14mn FinFET) related

patent: US 6885055”); Dkt. No. 547-12, Ex. 12 at 21:8–11, 22:25–24:12 (Deposition of Jong-Soo Seo).)

[FF126] In 2015, Samsung and P&IB expressly discussed a royalty rate with respect to licensing the ’055 Patent. (Dkt. No. 547-12, Ex. 12 at 23:23–24:12, 27:4–10 (Deposition of Jong-Soo Seo).) More specifically, Samsung considered taking a license “if the royalty level [was] adequate.” (Dkt. No. 547-12, Ex. K at 24:9–12, 27:4-10 (Deposition of Jong-Soo Seo).)

[FF127] The Court finds Samsung’s conduct during the licensing discussions inconsistent with any belief that it had an implied right to the ’055 Patent or that the ’055 Patent would not be asserted.

[FF128] Based on the record before the Court, the Court finds that from the beginning of Professor Lee’s interactions with Samsung regarding bulk FinFET transistors, he indicated that Samsung would need to license his invention if Samsung commercialized the technology.

[FF129] The Court further finds that P&IB approached Samsung about licensing of the ’055 Patent before Samsung had finalized the design of the bulk FinFET transistor at issue in this case, before it publicly announced a plan to sell products with the transistor design in the United States, and after it made this public.

[FF130] Defendants presented no evidence that in the licensing communications with P&IB in 2011, 2012, 2014, and 2015, Samsung indicated that it had rights to the ’055 Patent, or that it believed it would not have to face liability for the ’055 Patent.

[FF131] That Samsung analyzed its potential liability under the ’055 Patent in response to approaches from P&IB further illustrates that Samsung did not believe it had an implied license or that it had rights to the ’055 Patent.

[FF132] That Samsung discussed the pricing of rights to the '055 Patent with P&IB in 2012 and 2015 runs directly counter to any belief in an implied license or that the '055 Patent would not be asserted against it. Samsung presented no evidence that it ever raised internally before the start of this litigation the idea that it had rights to the '055 Patent, or that it believed it would not have to face liability for the '055 Patent.

[FF133] The Court finds that there is no evidence that Samsung, at any time before this litigation, indicated in either internal or external communications that it believed it had an implied license to use the '055 Patent, or that it believed the '055 Patent would not be asserted against it.

b. Intel

[FF134] In 2005, P&IB reached out to Intel regarding a sale or license of the '055 Patent. (Dkt. No. 534-17, Ex. 14 at 75:16–24, 111:4–116:25 (Deposition of Yong-Ho Son) (testifying about negotiations with Intel over licensing the '055 Patent); *see also* DX520; DX714; DX648.)

[FF135] Defendants presented no evidence that they were aware of this conduct or that it in any way influenced their decision-making or views.

[FF136] The Court finds this conduct is consistent with Professor Lee's testimony that he proposed (via email to Kinam Kim) that Samsung license the patent for commercial use.

c. Hynix

[FF137] In 2006, P&IB reached out to Hynix regarding a sale or license of "Prof. Lee's patent." (Dkt. No. 534-21, Ex. 18 (email correspondence between Mr. Son and Hynix regarding meeting to discuss P&IB's offer to sell "Professor Jong-Ho Lee's patent").) However, that email references the "attached" patent but the attachments were not produced to the Court.

[FF138] Without more, the Court cannot know if this 2006 email references the '055 Patent or one of Professor Lee's many other patents. (*See id.*)

[FF139] Nonetheless, Defendants presented no evidence that they were aware of this conduct or that it in any way influenced their decision-making or views.

H. Reliance on Conduct

[FF140] The Kim Declaration states that “Samsung became generally aware of the ’055 Patent” in 2006 and that it relied on a belief that Professor Lee would never assert the ’055 Patent when it decided to adopt the patented technology. (Kim Declaration ¶¶ 10–11.) The Court finds that these statements are contradicted by the record and evidence before the Court.

[FF141] None of the three Samsung engineers who testified regarding the bulk FinFET work at Samsung—Tai-Su Park, Heedon Jeong, and Dongwon Kim—testified that the ’055 Patent in any way influenced Samsung’s decision to commercialize the 14 nm bulk FinFET design. (Dkt. 547-7, Ex. F at 49:6–9 (Deposition of Tai-Su Park) (testifying that he was not involved in the commercial development of bulk FinFET transistors at Samsung); Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 44:22–53:6 (testimony of Heedon Jeong discussing the commercialization of the bulk FinFET technology); Dkt. No. 547-10, Ex. I at 314:13–20 (Deposition of Dongwon Kim) (“[MR. SHEASBY]: Did you consider Professor Lee’s ’055 Patent? [DONGWON KIM]: When we developed the FinFET technology, I was not aware of that patent.”).)

[FF142] Dongwon Kim testified that he was not aware of the ’055 Patent until 2012. (Dkt. No. 547-9 at 30:21-25 (Deposition of Dongwon Kim).)

[FF143] Dongwon Kim testified that he reviewed the ’055 Patent in 2013 but concluded, “[w]e thought that his patent was not quite important, so we did not pay really much attention to that.” (Dkt. No. 547-9, Ex. H at 113:25–114:8 (Deposition of Dongwon Kim) (testifying about Professor Lee’s “bulk FinFET patent”); Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 109:13–23,

111:6–11, 112:7–18 (testifying as to the reasons he believed the '055 Patent was different than Samsung's 14 nm technology).)

[FF144] Dongwon Kim did not make the decision for Samsung to commercialize a bulk FinFET transistor. He testified that the decision was made in 2010 by the head of the Samsung R&D Center, Jung Chilhee. (Dkt. No. 547-9, Ex. H at 31:25–32:23 (Deposition of Dongwon Kim).)

[FF145] Defendants did not present any evidence from Jung Chilhee nor did he testify at the trial.

[FF146] Defendants did not present any evidence regarding the mental state of the individuals who made the decision to launch the bulk FinFET design in the United States, their views of Professor Lee's interactions with Samsung, or their views of the '055 Patent.

[FF147] Dongwon Kim testified that he never told his superiors about the '055 Patent nor did he (prior to the post-trial declaration) state that there was any reliance by decision makers at Samsung regarding the '055 patent. (Dkt. No. 547-9 at 113:2–24 (Deposition of Dongwon Kim).)

[FF148] At trial, he testified (as Samsung's corporate representative) that he believed the '055 Patent was not similar to Samsung's 14 nm bulk FinFET technology. The Court finds that this trial testimony contradicts the testimony in his declaration namely that: the '055 Patent influenced Samsung's decision to commercialize 14 nm bulk FinFet technology, or that Samsung relied on any conduct by Professor Lee, P&IB, or KAIST (and its parent company) that Samsung could use the '055 Patent.

[FF149] Samsung's 30(b)(6) witnesses Dongwon Kim and Tai-Su Park testified that Professor Lee never gave them permission to use the '055 Patent. (Dkt. No. 547-9, Ex. H at

123:20–124:4 (Deposition of Dongwon Kim); Dkt. 547-7, Ex. F at 114:16–115:2 (Deposition of Tai-Su Park); Dkt. No. 494, June 13, 2018 P.M. Trial Tr. at 4:18–23 (Trial testimony of Dongwon Kim).)

[FF150] Dr. Kelin Kuhn testified at trial that because prevailing market forces required Defendants to invest in a process technology smaller than 20 nm, Defendants were going to invest in creating a sub-20 nm process node regardless of the '055 Patent. (Dkt. No. 491, June 12, 2018 P.M. Trial Tr. at 90:17–24, 108:21–109:23.)

[FF151] Mr. David Witt also testified that Defendants “adopted the 14-nanometer bulk FinFET transistor to continue business after 20 nanometers.” (*See id.* at 129:23–130:3.)

[FF152] Based on the record before the Court, the Court finds that Defendants have not proven that Samsung in any way relied on the '055 Patent or Professor Lee's statements regarding the patent technology of the '055 Patent when it decided to commercialize the 14 nm bulk FinFET technology.

I. Designing Around the '055 Patent

[FF153] The Dongwon Kim Declaration also suggests that, had Samsung known that it would face liability for the '055 Patent, it would have designed around the patent. (Kim Declaration ¶¶ 13–14.)

[FF154] However, Dongwon Kim testified that he thought the '055 Patent was not “important.” FF143. He also testified at trial that he did not believe the '055 Patent was similar to Samsung's bulk FinFET technology. *See id.*

[FF155] Heedon Jeong, the senior Samsung engineer responsible for transitioning the 14 nm design to commercial manufacturing, testified that, for the 14 nm and 10 nm nodes, he was

not “aware of any commercially viable alternative to bulk FinFET.” (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 52:4–18.)

[FF156] Vasisht Vadi, a senior engineer at Qualcomm and its 30(b)(6) witness, testified that, in 2014, “the entire industry” had embraced “bulk FinFET.” (Dkt. No. 493, June 13, 2018 A.M. Trial Tr. at 84:16-85:6.)

[FF157] Defendants’ technical expert, Vivek Subramanian, admitted that “[i]n 2013 to 2015 time frame, every major foundry in the world, when they commercialized a sub20-nanometer process technology, selected bulk FinFET technology.” (Dkt. No. 493, June 14, 2018 P.M. Trial Tr. at 28:22–29:1.)

[FF158] Mr. Subramanian testified that when Qualcomm (the largest mobile chip manufacturer in the world) “was making a decision as to where to go after 20 nanometers, ever[y] alternate it considered was bulk silicon FinFET.” (Dkt. No. 493, June 14, 2018 P.M. Trial Tr. at 28:11–14 (Testimony of Vivek Subramanian).)

[FF159] Dongwon Kim testified that Samsung repeatedly considered and rejected silicon on insulator FinFET in 2010, “at the 14-nanometer process technology node,” and “at the 10-nanometer technology node.” (Dkt. No. 547-9, Ex. H at 139:11–24 (Deposition of Dongwon Kim).)

[FF160] Dongwon Kim also testified that Samsung did not proceed with silicon on insulator FinFET because the supply of silicon on insulator wafers “would be impossible for mass production.” (Dkt. No. 534-23, Ex. 20 at 136:17–138:24 (Deposition of Dongwon Kim).)

[FF161] The Court finds while Samsung repeatedly revisited the question of using silicon on insulator FinFET and rejected this option, Samsung’s decision to forego use of the

silicon on insulator FinFET was unrelated to the 14 nm bulk FinFET technology at issue in this case.

II. CONCLUSIONS OF LAW

A. Legal Standard

1. Federal Rule of Civil Procedure 52

[CL1] “If a party has been fully heard on an issue . . . the court may enter judgment against the party on a claim or defense that, under the controlling law, can be maintained or defeated only with a favorable finding on that issue.” Fed. R. Civ. P. 52(c). Such a judgment “must be supported by findings of fact and conclusions of law.” *Id.*

[CL2] The purpose of these findings is to “afford[] . . . a clear understanding of the ground or basis of the decision of the trial court.” *S. S. Silberblatt, Inc. v. U.S. for Use & Benefit of Lambert Corp.*, 353 F.2d 545, 549 (5th Cir. 1965) (internal quotation marks omitted); *see also Schlesinger v. Herzog*, 2 F.3d 135, 139 (5th Cir. 1993) (explaining that trial courts need not “recite every piece of evidence” or “sort through the testimony of . . . dozen[s] [of] witnesses”).

[CL3] In making a particular finding, the district court “does not . . . draw any inferences in favor of the non-moving party and . . . [instead] make[s] a determination in accordance with its own view of the evidence.” *Fairchild v. All Am. Check Cashing, Inc.*, 815 F.3d 959, 964 n.1 (5th Cir. 2016) (internal quotation marks omitted). However, a district court still must arrive at each of its factual determinations based on the applicable burden of proof. *In re Medrano*, 956 F.2d 101, 102 (5th Cir. 1992) (reversing the district court because it applied the preponderance of the evidence standard rather than the clear and convincing standard in making its factual determinations under Rule 52).

2. Equitable Estoppel

[CL4] Equitable estoppel is a complete defense to patent infringement. *See A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1041 (Fed. Cir. 1992) (“Where equitable estoppel is established, all relief on a claim may be barred.”).

[CL5] The owner of a patent may forfeit its right to any relief from an infringer where: (1) the patentee, through misleading conduct (or silence), leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer; (2) the alleged infringer relies on that conduct; and (3) the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim. *Radio Sys. Corp. v. Lalor*, 709 F.3d 1124, 1130 (Fed. Cir. 2013) (citing *Aukerman*, 960 F.2d at 1028).

[CL6] Absent special circumstances, such as fraud or intentional misconduct, the alleged infringer must prove each of these elements by a preponderance of the evidence. *Aukerman*, 960 F.2d at 1045–46.

[CL7] “Misleading ‘conduct’ may include specific statements, action, inaction, or silence when there was an obligation to speak.” *Aspex Eyewear Inc. v. Clariti Eyewear, Inc.*, 605 F.3d 1305, 1310 (Fed. Cir. 2010) (citing *Aukerman*, 960 F.2d at 1028)).

[CL8] “Delay in filing suit may be evidence which influences the assessment of whether the patentee’s conduct is misleading but it is not a requirement of equitable estoppel. Even where such delay is present, the concepts of equitable estoppel and laches are distinct from one another.” *Aukerman*, 960 F.2d at 1041–42.

[CL9] “The patentee’s conduct must have supported an inference that the patentee did not intend to press an infringement claim against the alleged infringer. It is clear, thus, that for equitable estoppel the alleged infringer cannot be unaware . . . of the patentee and/or its patent.”

Aukerman, 960 F.2d at 1042; *see also Genband US LLC v. Metaswitch Networks Ltd.*, 211 F. Supp. 3d 858, 899 (E.D. Tex. 2016).

[CL10] The alleged infringer must know or reasonably be able to infer that the patentee has known about the allegedly infringing activities. *Aukerman*, 960 F.2d at 1042. In other words, the alleged infringer must be committing its infringing acts to give rise to a claim of equitable estoppel. *See id.*

[CL11] “In the most common situation, the patentee specifically objects to the activities currently asserted as infringement in the suit and then does not follow up for years.” *Aukerman*, 960 F.2d at 1042.

[CL12] For misleading inaction to equate to misleading conduct, the patentee’s “inaction must be combined with other facts respecting the relationship or contacts between the parties to give rise to the necessary inference that the claim against the defendant is abandoned.” *Aukerman*, 960 F.2d at 1042; *see also Hemstreet v. Computer Entry Sys. Corp.*, 972 F.2d 1290, 1295 (Fed. Cir. 1992) (“Mere silence must be accompanied by some *other* factor which indicates that the silence was sufficiently misleading as to amount to bad faith.”) (emphasis in original).

[CL13] To show reliance, the alleged infringer must demonstrate that, “in fact, it substantially relied on the misleading conduct of the patentee in connection with taking some action. . . . To show reliance, the infringer must have had a relationship or communication with the plaintiff which lulls the infringer into a sense of security in going ahead with building the [infringing product].” *Aukerman*, 960 F.2d at 1042–43.

[CL14] The third element of the estoppel defense requires an alleged infringer to show “that it would be materially prejudiced if the patentee is now permitted to proceed” on claims it

earlier abandoned. *Aukerman*, 960 F.2d at 1043. Material prejudice may be economic or evidentiary. *Id.*

[CL15] Economic prejudice “may be shown by a change of economic position flowing from actions taken or not taken by the patentee.” *Aspex Eyewear*, 605 F.3d at 1312–13 (citing *ABB Robotics, Inc. v. GMFanuc Robotics Corp.*, 52 F.3d 1062, 1065 (Fed. Cir. 1995) (“[C]ases in which economic prejudice has been found lacking did not so hold because of a lack of capital investments, but, rather, because the alleged infringer failed to prove that their increased expenditures, i.e., on marketing and development, were in any way related to actions taken by the patentee.”)).

[CL16] Evidentiary prejudice “may arise by reason of a defendant’s inability to present a full and fair defense on the merits due to the loss of records, the death of a witness, or the unreliability of memories of long past events, thereby undermining the court’s ability to judge the facts.” *Aukerman*, 960 F.2d at 1033 (citations omitted).

[CL17] The Court must consider all evidence relevant to the equities. *See Aspex Eyewear*, 605 F.3d at 1310 (citing *Aukerman*, 960 F.2d at 1043).

3. Implied License

[CL18] “In patent law, an implied license merely signifies a patentee’s waiver of the statutory right to exclude others from making, using, or selling the patented invention.” *Wang Labs., Inc. v. Mitsubishi Elecs. America, Inc.*, 103 F.3d 1571, 1580 (Fed. Cir. 1997).

[CL19] An implied license exists when: (1) a relationship existed between the patentee and the infringer; (2) within that relationship, the patentee transferred a right to use the patented invention to the infringer; (3) the patentee received valuable consideration for the grant of that right; (4) the patentee denied that the infringer had an implied license, and (5) the patentee’s statements and conduct created the impression that patentee consented to infringer making, using

or selling patentee's patented inventions, including sales to consumers other than the patentee. *Wang Labs.*, 103 F.3d at 1579; *see also Mass Engineered Design, Inc. v. Ergotron, Inc.*, 633 F.Supp.2d 361, 388 (E.D. Tex. 2009).

[CL20] Defendants must establish the elements of an implied license by a preponderance of the evidence. *Wang Labs.*, 103 F.3d at 1576.

[CL21] Courts and legal commentators relate that implied licenses arise by acquiescence, by conduct, by equitable estoppel (estoppel *in pais*) or by legal estoppel. *Wang Labs.*, 103 F.3d at 1580.

[CL22] The primary difference between the analysis in implied license cases and equitable estoppel “is that implied license looks for an affirmative grant of consent or permission to make, use, or sell: i.e., a license.” *Wang Labs.*, 103 F.3d at 1581. Equitable estoppel, on the other hand, focuses on “misleading” conduct suggesting that the patentee will not enforce patent rights.

[CL23] “An implied license by equitable estoppel requires proof that: (1) the patentee, through statements or conduct, gave an affirmative grant of consent or permission to make, use, or sell to the alleged infringer; (2) the alleged infringer relied on that statement or conduct; and (3) the alleged infringer would, therefore, be materially prejudiced if the patentee is allowed to proceed with its claim.” *Winbond Elecs. Corp. v. International Trade Com’n*, 262 F.3d 1363, 1374 (Fed. Cir. 2001), opinion corrected, 275 F.3d 1344 (Fed. Cir. 2001).

B. Analysis

1. Waiver

[CL24] Plaintiff argues that “Defendants did not disclose their current equitable defenses until the April 11, 2018 joint final pre-trial order.” (Dkt. No. 569 at 28–30.) As such,

Plaintiff argues that “this represents an independent basis on which judgment disposing of the defenses can be entered by the Court.” (*Id.* at 30.)

[CL25] The Court rejects such arguments from Plaintiff. At no point during the pre-trial proceedings did Plaintiff move to strike or dismiss Defendants’ equitable defenses. In fact, Plaintiff acknowledged Defendants’ equitable defenses at the pre-trial conference on April 18, 2018 as issues that are tried to the judge and not the jury. (Dkt. No. 387, Hr’g Tr. at 8:16–21 (referencing implied license and equitable estoppel in the Joint Final Pre-trial Order).) Plaintiff argued that those arguments pertaining to equitable estoppel and implied license could not go to the jury because they were questions of law. (*Id.* at 14:1–15:13.) Plaintiff never raised an issue of waiver nor did it argue that such defenses should be stricken for their untimely disclosure.

[CL26] Accordingly, the Court concludes that Defendants have not waived their equitable estoppel and implied license theories.

2. **The Court Concludes that Defendants Have Not Proven by a Preponderance of the Evidence that Equitable Estoppel Bars Plaintiff’s Claim**

[CL27] Based on the findings of fact and applicable legal standards, the Court finds that the doctrine of equitable estoppel does not bar Plaintiff’s claims.

a. **Misleading Conduct**

[CL28] Defendants have not proven by a preponderance of the evidence that either the Plaintiff or its predecessors, through misleading conduct, led Defendants to reasonably infer that Plaintiff or its predecessors did not intend to enforce the ’055 Patent against Defendants. For the purposes of this analysis, predecessors include Professor Lee, P&IB, and Plaintiff’s parent entity KAIST IP Co. Ltd.

[CL29] Defendants have not shown reliance prior to 2006 because Samsung did not have knowledge of the '055 Patent. Thus, the only conduct which Defendants could point to as “misleading” would be the licensing discussions in 2011, 2012, 2015, and 2017. The Court finds that none of these discussions support an inference that Plaintiff or its predecessors did not intend to bring an infringement claim against Samsung. To the contrary, the record reflects that Samsung even contemplated taking a license on the '055 Patent dependent on the royalty rate. Logic tells the Court that parties do not contemplate taking a license to a patent that will not be asserted against them.

[CL30] Even if knowledge of the patent was not required for equitable estoppel, the Court finds that Professor Lee’s pre-2006 conduct does not support an inference that Plaintiff or its predecessors did not intend to bring an infringement claim against Samsung.

[CL31] From the beginning of the interactions between Professor Lee and Samsung relating to bulk FinFET technology, the record establishes that Samsung was on notice that it was expected to license the technology if it decided to use it commercially.

[CL32] This consistent position extended to the negotiations between P&IB and Samsung before Samsung finalized the design of the bulk FinFET transistor at issue in this case, and this consistent position applied, both before and after, Samsung announced its intent to launch a product with the transistor in the United States.

[CL33] No reasonable person in the position of the Defendants could reasonably infer, and Defendants did not infer, that the '055 Patent would not be enforced against it.

[CL34] Moreover, Defendants did not establish that Plaintiff or its predecessors knew about Samsung’s infringing activities by developing the 14 nm bulk FinFET technology prior to its public announcement of such.

[CL35] Defendants have not shown any bad faith by Plaintiff or its predecessors or any other facts that would establish their “mere silence” or “inaction” was misleading conduct, sufficient to prove the first element of equitable estoppel.

b. Reliance

[CL36] Defendants have not proven by a preponderance of the evidence that any Defendant relied on any conduct by Plaintiff or its predecessors.

[CL37] Defendants have not established that Plaintiff or its predecessors “lull[ed] the infringer [Samsung] into a sense of security” with developing the bulk FinFET technology for commercial production. *See Aukerman*, 960 F.2d at 1043.

[CL38] The Court concludes that Samsung’s commercial development of the 14 nm bulk FinFET technology was independent of any action or conduct by Plaintiff or its predecessors, including Professor Lee.

[CL39] The Court concludes that Samsung’s decision to proceed with a commercial bulk FinFET transistor was not premised in any way on a reasonable belief that Defendants had rights to use the ’055 Patent, or that the ’055 Patent would not be asserted against it.

[CL40] Defendants declined to make non-infringing design changes to the bulk FinFET transistor even after P&IB approached them about licensing the patent, despite the fact that there was an opportunity to influence the shape of the source and drain regions on the device.

c. Material Prejudice

[CL41] Defendants have not proven by a preponderance of the evidence that they will be materially prejudiced if the Plaintiff is allowed to proceed with its claims.

[CL42] The Court concludes that Defendants did not establish that they suffered any economic prejudice or harm. Defendants would have made the same economic investments in the 14 nm bulk FinFET technology regardless of the conduct of Plaintiff or its predecessors.

[CL43] The Court further concludes that there was no evidentiary prejudice or harm visited upon Defendants. Defendants argue that they suffered evidentiary prejudice because Professor Lee's delay in enforcing the '055 Patent caused a loss of documents related to Samsung's work with Professor Lee. Defendants further allege that this evidence would help to support claim that Dr. Park was a co-inventor of the '055 Patent. However, Defendants declined to present an improper inventorship defense in this case and withdrew their contention that Tai-Su Park was a co-inventor at the pre-trial conference.

[CL44] Accordingly, the Court concludes that Defendants cannot claim a prejudicial loss of evidence to support a defense that it voluntarily withdrew.

3. The Court Concludes that Defendants Have Not Proven by a Preponderance of the Evidence that Implied License Bars Plaintiff's Claim

[CL45] In light of this Court's conclusion that Defendants have not established by a preponderance of the evidence any elements of equitable estoppel, Defendants cannot establish an implied license via equitable estoppel.

[CL46] The Court concludes that Defendants have not established that there was a transfer of right to use the '055 Patent from Plaintiff or any of its predecessors to Samsung, that Defendants gave valuable consideration for such transfer, or that Plaintiff or its predecessors gave the impression that they consented to Samsung's use of the patented invention.

[CL47] The Court concludes that Defendants have not established that Plaintiff or its predecessors transferred any rights related to the '055 Patent to Samsung.

[CL48] Defendants provided no evidence that Plaintiff or its predecessors transferred a right to use the '055 Patent to Samsung.

[CL49] To the contrary, Samsung engaged in discussions with Plaintiff's predecessors regarding a potential license to the '055 Patent. Samsung never asserted its belief that it already had a right to use the '055 Patent during any of those discussions. Samsung's witnesses testified that it would have obtained a license but for the proposed royalty rate.

[CL50] The Court concludes that Samsung's conduct during the licensing discussions negates any claim to an implied license.

[CL51] Defendants also have failed to establish that they provided any consideration for any right to use the '055 Patent. To the contrary, the record at trial established that Defendants benefitted greatly from Professor Lee's expertise and received significant guidance from him separate from the patent-at-issue.

[CL52] Neither Plaintiff nor its predecessors ever promised to forgo any claim of infringement based on the '055 Patent; neither did Plaintiff or its predecessors indicate in any manner that they would forego any claim for infringement based on the '055 Patent.

[CL53] Defendants have failed to establish that the statements and conduct of Plaintiff or its predecessors created the reasonable impression that they consented to Defendants making, using, or selling Plaintiff's patented inventions. The first 14 nm bulk FinFET test chip was not created until 2012, and the first public announcement of imminent sale in the United States was not made until 2015. By these points in time, Plaintiff and its predecessors had repeatedly made clear to Samsung that it should take a license to the technology if it wanted to use it commercially. The affirmative acts that occurred both before and since the end of the bulk FinFET joint

publications in 2006 were sufficient to make clear to Samsung that it did not have any implied rights to the '055 Patent.

4. GlobalFoundries and Qualcomm

[CL54] Because this Court finds that Defendants have not established the defenses of equitable estoppel and implied license, the Court need not reach whether GlobalFoundries and Qualcomm can take advantage of these defenses when the factual predicates relating to them are directed solely at Samsung.

III. CONCLUSION

For the reasons set forth above, the Court concludes that Defendants have not established by a preponderance of the evidence their affirmative defenses of equitable estoppel and implied license. Accordingly, the Court **FINDS, CONCLUDES, AND ORDERS** that Defendants' equitable defenses do not bar Plaintiff's claims. The Court accordingly **FINDS, CONCLUDES, AND ORDERS** that the jury's verdict holding that Defendants have infringed the asserted claims of the '055 Patent stands and remains fully intact.

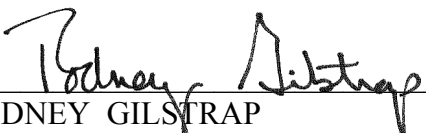
The Court will forthwith enter a docket control order for the scheduling of deadlines related to post-trial motions, including those under Fed. R. Civ. P. 50(b) and Fed. R. Civ. P. 59.

To the extent these findings of fact and conclusions of law do not address relief requested by either party, such relief is **DENIED**.

It is further **ORDERED** that because there may be confidential or proprietary information set forth herein, this ruling will remain **PROVISIONALLY SEALED** until the Parties jointly file and the Court acts upon the Parties' proposed redactions. Such proposed redactions should include specific explanations for the necessity of such redactions as balanced against the Public's interest in open judicial proceedings. *Richmond Newspapers v. Virginia*, 448 U.S. 555, 592 (1980)

("[O]pen trials are bulwarks of our free and democratic government: public access to court proceedings is one of the numerous 'checks and balances' of our system, because 'contemporaneous review in the forum of public opinion is an effective restraint on possible abuse of judicial power.'") (quoting *In re Oliver*, 333 U.S. 257, 270 (1948)). The proposed redactions shall be filed within seven (7) days of this Order. Failure to submit timely proposed redactions will result in the complete unsealing of the Order, which, in such case, may not be redacted upon later motion made by the Parties.

So ORDERED and SIGNED this 18th day of January, 2019.



RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE